

Remarks

Applicant respectfully requests reconsideration of this application as amended. Claims 1-6, 8-12, and 14-18 have been amended. Claims 1, 7, 13, 19, and 20 have been cancelled. Claims 21-25 have been added. Therefore, claims 1-6, 8-12, 14-18, and 21-25 are presented for examination.

Claim Objections

Claims 6, 12, and 18 stand objected to because of the following formalities: The limitation 'form' should refer to a 'set of values' as such set is being joined to complete an order; hence should be in 3rd person format verb like in 'forms'. Applicant has amended claims 6, 12, and 18 to appear in better form for allowance. Applicant respectfully requests the objections to these claims be withdrawn.

35 U.S.C. §101 Rejection

Claims 1, 7, 13 and 19 stand rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. Claims 1, 7, 13, and 19 have been cancelled. Therefore, applicant respectfully requests the §101 rejection to these claims be withdrawn.

35 U.S.C. §112 Rejection

Claim 13 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention. Claim 13 has been cancelled. Therefore, applicant respectfully requests the §112 rejection to this claim be withdrawn.

35 U.S.C. §103(a) Rejection

Claims 1-4, 7-10, 13-16 and 19-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pande et al., “Interprocedural Def-Use Association in C Programs”, *Proceedings of the symposium on Testing, analysis, and verification*, pp.139-152, October 1991 [hereinafter “Pande”], in view of Harrold et al., “Efficient Computation of Interprocedural Definition-Use Chains”, *ACM Transactions on Programming Languages and Systems (TOPLAS)*, Volume 16 Issue 2, March 1994, pp. 175-204 [hereinafter “Harrold”]. Applicant submits that the present claims are patentable over Pande in view of Harrold.

Pande discloses an algorithm for obtaining definition-use associations in a C program with single level pointers. The algorithm uses program-point-specific pointer-induced aliases to obtain good approximations to the set of definitions reaching a program point. This definition-use algorithm is based on a polynomial-time interprocedural reaching definitions calculation. (See Pande at page 139.)

Harrold discloses algorithms for computing interprocedural definition-use and use-definition chains. More specifically, Harrold discloses the construction of an interprocedural flow graph (IFG) through the use of the interprocedural definition-use and use-definition chains. The IFG of Harrold includes four types of nodes including an entry, exit, call, and return nodes. An entry node represents the point prior to entry into a procedure. An exit node represents the point after the end of the procedure. A call node represents the point prior to the procedure call. A return node represents the points after the return from the

procedure call. A call node and return node are created for each actual parameter at a call site, and an entry node and exit node are created for each formal parameter in a procedure. (See Harrold at pg. 175, 180.)

Claim 2, as amended, recites:

A method, comprising:
assigning a definition-node for one or more definition statements in an intermediate language program;
assigning a use-node for one or more use statements in the intermediate language program;
assigning an alias-node for one or more aliases representing an equivalence class of memory accesses;
introducing an edge into a dependence flow graph connecting each definition-node to the alias-node corresponding to the alias representing the equivalence class to which the definition-node belongs; and
introducing an edge in the dependence flow graph connecting each use-node to the alias-node corresponding to the alias representing the equivalence class to which the use-node belongs.

Applicant submits that Pande does not disclose or suggest introducing an edge into a dependence flow graph connecting each definition-node to the alias-node corresponding to the alias representing the equivalence class to which the definition-node belongs, and further repeating this process for each use-node. The Office Action acknowledges that Pande “does not explicitly disclose...introducing a single edge into the graph connecting each definition-node to its associated alias-node; and introducing a single edge in the graph connecting each use-node to its associate alias-node.” (Office Action at page 5.) Therefore, Pande does not disclose or suggest the features of claim 2.

However, the Office Action cites Harrold as disclosing such a feature. (Office Action at page 6.) The Office Action states that “in light of the creation of a flow graph taking mark or strong note of an alias parameter as taught by Harrold by providing edge to such alias

parameter node from all read and write operations, the above teaching are suggested.” (Id.)

However, this is not the same as introducing an edge into a dependence flow graph connecting each definition-node to the alias-node corresponding to the alias representing the equivalence class to which the definition-node belongs, and further repeating this process for each use-node. Applicant can find no disclosure in Harrold of separate definition-nodes and use-nodes, each with an edge connecting it to an alias-node. Applicant further submits that such a feature is not obvious from the teachings of Pande and Harrold. As a result, Harrold does not disclose or suggest the features of claim 2.

Therefore, neither Pande nor Harrold, individually or in combination, disclose or suggest the features of claim 2. As such, claim 2 is patentable over Pande in view of Harrold. Claims 3-6 and 23 depend from claim 1 and include additional limitations. Therefore, claims 2-6 and 23 are also patentable over Pande in view of Harrold.

Claims 8, 14, and 21 recite, in part, introducing an edge into a dependence flow graph connecting each definition-node to the alias-node corresponding to the alias representing the equivalence class to which the definition-node belongs, and further repeating this process for each use-node. As discussed above, neither Pande nor Harrold disclose or suggest such a feature. Therefore, claims 8, 14, and 21 are patentable over Pande in view of Harrold for the reasons discussed above with respect to claim 1.

Claims 9-12 and 24 depend from claim 8, claims 15-18 and 25 depend from claim 14, and claim 22 depends from claim 21. As dependent claims necessarily include the limitations of their independent claims, claims 9-12, 15-18, 22, 24, and 25 are also patentable over Pande in view of Harrold.

Applicant respectfully submits that the rejections have been overcome and that the claims are in condition for allowance. Accordingly, applicant respectfully requests the rejections be withdrawn and the claims be allowed.

The Examiner is requested to call the undersigned at (303) 740-1980 if there remains any issue with allowance of the case.

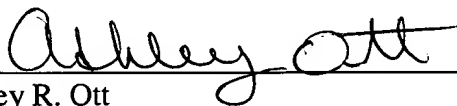
Applicant respectfully petitions for an extension of time to respond to the outstanding Office Action pursuant to 37 C.F.R. § 1.136(a) should one be necessary. Please charge our Deposit Account No. 02-2666 to cover the necessary fee under 37 C.F.R. § 1.17(a) for such an extension.

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,

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